

We claim the following:

1. A method for assigning notes to be played by a musical synthesizer to a predetermined number of channels of said musical synthesizer, said method including the following steps:

(a) receiving a signal indicating a new note event,
5 wherein a new note event is one of the following two events relating to a particular note: (i) the addition of said particular note (referred to herein as a "note-on event") to the notes being played by the musical synthesizer and (ii) the deletion of said particular note from the notes being
10 played by said musical synthesizer;

(b) determining whether said new note event is a note-on event;

(c) if said new note event is a note-on event, adding said particular note to a notes-on list;

15 (d) if said new note event is not a note-on event, deleting said particular note from said notes-on list;

(e) determining how many notes are on said notes-on list;

(f) selecting an assignment table corresponding to the
20 predetermined number of channels and how many notes are on said notes-on list;

(g) assigning notes to said channels pursuant to said assignment table and said notes-on list; and

(h) sending to said musical synthesizer a set of
25 commands corresponding to the assignment of notes to channels.

2. The method of Claim 1, wherein step (e) is as follows;

(e) determining how many notes are on said notes-on list and if there is not at least one note on said notes-on list, issuing a note-off command to said musical synthesizer for any note
5 currently being played on any channel.

3. A method for assigning notes to be played by a musical synthesizer to a predetermined number of channels of said musical synthesizer, said method including the following steps:

(a) receiving a signal indicating a new note event,
5 wherein a new note event is one of the following two events relating to a particular note: (i) the addition of said particular note (referred to herein as a "note-on event") to the notes being played by the musical synthesizer and (ii) the deletion of said particular note from the notes being
10 played by said musical synthesizer;

(b) determining whether said new note event is a note-on event;

(c) if said new note event is a note-on event, adding said particular note to a notes-on list;

15 (d) if said new note event is not a note-on event, deleting said particular note from said notes-on list;

(e) determining how many notes are on said notes-on list;

(f) selecting an assignment table corresponding to the
20 predetermined number of channels and how many notes are on said notes-on list;

(g) assigning notes to said channels pursuant to said assignment table and said notes-on list; and

25 (h) sending to a channel commands buffer a set of commands corresponding to the assignment of notes to channels.

4. A method for assigning notes to be played by a musical synthesizer to a predetermined number of channels of said musical synthesizer, wherein each channel of said musical synthesizer is configured such that once said channel is commanded to play a
5 particular note said channel continues playing said note until said channel is commanded to not play said note, said method including the following steps:

(a) receiving a signal indicating a new note event, wherein a new note event is one of the following two events
10 relating to a particular note: (i) the addition of said particular note (referred to herein as a "note-on event") to the notes being played by the musical synthesizer and (ii) the deletion of said particular note from the notes being played by said musical synthesizer;

15 (b) determining whether said new note event is a note-on event;

(c) if said new note event is a note-on event, adding said particular note to a notes-on list;

(d) if said new note event is not a note-on event,
20 deleting said particular note from said notes-on list;

(e) determining how many notes are on said notes-on list;

(f) selecting an assignment table corresponding to the predetermined number of channels and how many notes are on said notes-on list;

(g) assigning notes to said channels pursuant to said assignment table and said notes-on list;

(h) doing the following on a channel by channel basis,

(1) determining whether the note assigned to the channel pursuant to step (g) is the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event;

(2) if the note assigned to the channel pursuant to step (g) is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, determining whether there is a note assigned to the channel pursuant to step (g), and if there is no note assigned to the channel, sending a note-off command to said musical synthesizer with respect to said channel and the note currently being played by that channel; and

(3) if there is a note assigned to said channel pursuant to step (g), which note is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, determining whether said note assigned to said channel pursuant to step (g) is the same as any of the notes which were assigned to any of the other of said

channels just prior to the reception of said signal
50 indicating said new note event, and doing the following:

(i) if said note assigned to said channel is
the same as any of the notes which were assigned to
any of the other of said channels just prior to the
reception of said signal indicating said new note
55 event, sending a note-on command to said musical
synthesizer with respect to said channel and said
note, which command is accompanied by a soft attack
instruction; and

(ii) if said note assigned to said channel is
60 not the same as any of the notes which were
assigned to any of the other of said channels just
prior to the reception of said signal indicating
said new note event, sending a note-on command to
said musical synthesizer with respect to said
65 channel and said note, which command is accompanied
by a hard attack instruction.

5. A method for assigning notes to be played by a musical
synthesizer to a predetermined number of channels of said musical
synthesizer, wherein each channel of said musical synthesizer is
configured such that once said channel is commanded to play a
5 particular note said channel continues playing said note until
said channel is commanded to not play said note, said method
including the following steps:

(a) receiving a signal indicating a new note event,
wherein a new note event is one of the following two events

10 relating to a particular note: (i) the addition of said
particular note (referred to herein as a "note-on event") to
the notes to be played by the musical synthesizer and (ii)
the deletion of said particular note from the notes to be
played by said musical synthesizer;

15 (b) determining whether said new note event is a note-
on event;

(c) if said new note event is a note-on event, adding
said particular note to a notes-on list;

(d) if said new note event is not a note-on event,
20 deleting said particular note from said notes-on list;

(e) determining how many notes are on said notes-on
list;

(f) selecting an assignment table corresponding to the
predetermined number of channels and how many notes are on
25 said notes-on list;

(g) assigning notes to said channels pursuant to said
assignment table and said notes-on list;

(h) doing the following on a channel by channel basis,
(1) determining whether the note assigned to the
30 channel pursuant to step (g) is the same as the note
which was assigned to said channel just prior to the
reception of said signal indicating said new note event;

(2) if the note assigned to the channel pursuant
to step (g) is not the same as the note which was
35 assigned to said channel just prior to the reception of
said signal indicating said new note event, determining

whether there is a note assigned to the channel pursuant to step (g), and if there is no note assigned to the channel, sending a note-off command to a channel commands buffer with respect to said channel and the note currently being played by that channel; and

(3) if there is a note assigned to said channel pursuant to step (g), which note is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, determining whether said note assigned to said channel pursuant to step (g) is the same as any of the notes which were assigned to any of the other of said channels just prior to the reception of said signal indicating said new note event, and doing the following:

(i) if said note assigned to said channel is the same as any of the notes which were assigned to any of the other of said channels just prior to the reception of said signal indicating said new note event, sending a note-on command to said a channel commands buffer with respect to said channel and said note, which command is accompanied by a soft attack instruction; and

(ii) if said note assigned to said channel is not the same as any of the notes which were assigned to any of the other of said channels just prior to the reception of said signal indicating said new note event, sending a note-on command to

65 said a channel commands buffer with respect to said
channel and said note, which command is accompanied
by a hard attack instruction.

6. A method for assigning notes to be played by a musical
synthesizer to a predetermined number of channels of said musical
synthesizer, wherein each channel of said musical synthesizer is
configured such that once said channel is commanded to play a
5 particular note said channel continues playing said note until
said channel is commanded to not play said note, said method
including the following steps:

 (a) receiving a signal indicating a new note event,
 wherein a new note event is one of the following two events
10 relating to a particular note: (i) the addition of said
particular note (referred to herein as a "note-on event") to
the notes being played by the musical synthesizer and (ii)
the deletion of said particular note from the notes being
played by said musical synthesizer;

15 (b) determining whether said new note event is a note-
on event;

 (c) if said new note event is a note-on event, adding
said particular note to a notes-on list;

 (d) if said new note event is not a note-on event,
20 deleting said particular note from said notes-on list;

 (e) determining how many notes are on said notes-on
list;

(f) selecting an assignment table corresponding to the predetermined number of channels and how many notes are on said notes-on list;

(g) assigning notes to said channels pursuant to said assignment table and said notes-on list;

(h) doing the following on a channel by channel basis,

(1) determining whether the note assigned to the channel pursuant to step (g) is the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event;

(2) if the note assigned to the channel pursuant to step (g) is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, determining whether there is a note assigned to the channel pursuant to step (g), and if there is no note assigned to the channel, sending a note-off command to said musical synthesizer with respect to said channel and the note currently being played by that channel; and

(3) if there is a note assigned to said channel pursuant to step (g), which note is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, doing the following:

(i) if said new note event is not a note-on event, sending a note-on command to said musical synthesizer with respect to said channel and said

50 note, which command is accompanied by a soft attack
instruction; and

 (ii) if said new note event is a note-on
event, sending a note-on command to said musical
synthesizer with respect to said channel and said
55 note, which command is accompanied by a hard attack
instruction.

7. A method for assigning notes to be played by a musical
synthesizer to a predetermined number of channels of said musical
synthesizer, wherein each channel of said musical synthesizer is
configured such that once said channel is commanded to play a
5 particular note said channel continues playing said note until
said channel is commanded to not play said note, said method
including the following steps:

 (a) receiving a signal indicating a new note event,
wherein a new note event is one of the following two events
10 relating to a particular note: (i) the addition of said
particular note (referred to herein as a "note-on event") to
the notes to be played by the musical synthesizer and (ii)
the deletion of said particular note from the notes to be
played by said musical synthesizer;

15 (b) determining whether said new note event is a note-
on event;

 (c) if said new note event is a note-on event, adding
said particular note to a notes-on list;

 (d) if said new note event is not a note-on event,
20 deleting said particular note from said notes-on list;

(e) determining how many notes are on said notes-on list;

(f) selecting an assignment table corresponding to the predetermined number of channels and how many notes are on said notes-on list;

(g) assigning notes to said channels pursuant to said assignment table and said notes-on list;

(h) doing the following on a channel by channel basis,

(1) determining whether the note assigned to the channel pursuant to step (g) is the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event;

(2) if the note assigned to the channel pursuant to step (g) is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, determining whether there is a note assigned to the channel pursuant to step (g), and if there is no note assigned to the channel, sending a note-off command to a channel commands buffer with respect to said channel and the note currently being played by that channel; and

(3) if there is a note assigned to said channel pursuant to step (g), which note is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, doing the following:

(i) if said new note event is not a note-on event, sending a note-on command to said channel commands buffer with respect to said channel and said note, which command is accompanied by a soft attack instruction; and

(ii) if said new note event is a note-on event, sending a note-on command to said channel commands buffer with respect to said channel and said note, which command is accompanied by a hard attack instruction.

8. A method for assigning notes to be played by a musical synthesizer to a predetermined number of channels of said musical synthesizer, wherein each channel of said musical synthesizer is configured such that once said channel is commanded to play a particular note said channel continues playing said note until said channel is commanded to not play said note, said method including the following steps:

(a) receiving a signal indicating a new note event, wherein a new note event is one of the following two events relating to a particular note: (i) the addition of said particular note (referred to herein as a "note-on event") to the notes being played by the musical synthesizer and (ii) the deletion of said particular note from the notes being played by said musical synthesizer;

(b) determining whether said new note event is a note-on event;

(c) if said new note event is a note-on event, adding said particular note to a notes-on list;

20 (d) if said new note event is not a note-on event, deleting said particular note from said notes-on list;

(e) determining how many notes are on said notes-on list;

25 (f) selecting an assignment table corresponding to the predetermined number of channels and how many notes are on said notes-on list;

(g) assigning notes to said channels pursuant to said assignment table and said notes-on list;

30 (h) storing an old note/channel list reflecting the assignment of notes to channels just prior to the reception of said signal indicating said new note event;

(i) doing the following on a channel by channel basis,

35 (1) determining whether the note assigned to the channel pursuant to step (g) is the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event;

40 (2) if the note assigned to the channel is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, determining whether there is a note assigned to the channel pursuant to step (g), and if there is no note assigned to the channel, storing an a note-off command in a channel commands buffer with

respect to said channel and the note currently being played by that channel; and

45 (3) if there is a note assigned to said channel pursuant to step (g), which note is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, determining whether said note assigned to said
50 channel pursuant to step (g) is the same as any of the notes on the old note/channel list, and doing the following:

 (i) if said note assigned to said channel is the same as any of the notes on the old
55 note/channel list, storing a note-on command with respect to said channel and said note, which command is accompanied by a soft attack instruction, in said channel commands buffer; and

 (ii) if said note assigned to said channel is
60 not the same as any of the notes on the old/note channel list, storing a note-on command with respect to said channel and said note, which command is accompanied by a hard attack instruction, in said channel commands buffer; and

65 (j) sending to said musical synthesizer the commands stored in said channel commands buffer when step (i) is completed with respect to all of said predetermined number of channels.

9. The method of Claim 8 wherein said musical synthesizer is a sampler.

10. The method of Claim 9 including the additional step of storing a separate library for each of said channels.

11. A method for assigning notes to be played by a musical synthesizer to a predetermined number of channels of said musical synthesizer, wherein each channel of said musical synthesizer is configured such that once said channel is commanded to play a particular note said channel continues playing said note until
5 said channel is commanded to not play said note, said method including the following steps:

(a) receiving a signal indicating a new note event, wherein a new note event is one of the following two events
10 relating to a particular note: (i) the addition of said particular note (referred to herein as a "note-on event") to the notes being played by the musical synthesizer and (ii) the deletion of said particular note from the notes being played by said musical synthesizer;

15 (b) determining whether said new note event is a note-on event;

(c) if said new note event is a note-on event, adding said particular note to a notes-on list;

20 (d) if said new note event is not a note-on event, deleting said particular note from said notes-on list;

(e) determining how many notes are on said notes-on list;

(f) selecting an assignment table corresponding to the predetermined number of channels and how many notes are on said notes-on list;

(g) assigning notes to said channels pursuant to said assignment table and said notes-on list;

(h) storing an old note/channel list reflecting the assignment of notes to channels just prior to the reception of said signal indicating said new note event;

(i) doing the following on a channel by channel basis,

(1) determining whether the note assigned to the channel pursuant to step (g) is the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event;

(2) if the note assigned to the channel is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, determining whether there is a note assigned to the channel pursuant to step (g), and if there is no note assigned to the channel, storing an a note-off command in a channel commands buffer with respect to said channel and the note currently being played by that channel; and

(3) if there is a note assigned to said channel pursuant to step (g), which note is not the same as the note which was assigned to said channel just prior to the reception of said signal indicating said new note event, doing the following:

50 (i) if said new note event is not a note-on event, storing a note-on command with respect to said channel and said note, which command is accompanied by a soft attack instruction, in said channel commands buffer; and

55 (ii) if said new note event is a note-on event, storing a note-on command with respect to said channel and said note, which command is accompanied by a hard attack instruction, in said channel commands buffer; and

60 (j) sending to said musical synthesizer the commands stored in said channel commands buffer when step (i) is completed with respect to all of said predetermined number of channels.

12. The method of Claim 11 wherein said musical synthesizer is a sampler.

13. The method of Claim 12 including the additional step of storing a separate library for each of said channels.

14. A system for assigning notes to be played by a musical synthesizer to a predetermined number of channels of said musical synthesizer after said system's receiving a signal indicating a new note event, wherein a new note event is one of the following
5 two events relating to a particular note: (i) the addition of said particular note (referred to herein as a "note-on event") to the notes being played by the musical synthesizer and (ii) the deletion of said particular note from the notes being played by said musical synthesizer, wherein each channel of said musical

10 synthesizer is configured such that once said channel is commanded
to play a particular note said channel continues playing said note
until said channel is commanded to not play said note, said system
including,

(a) a CPU,

15 (b) a notes-on list memory location for storing a list
of notes to be played (said list of notes to be played
hereinafter referred to as a "notes-on list"),

(c) an assignment tables memory location for storing
assignment tables,

20 (d) an old note/channel list memory location for
storing a list of notes and corresponding channels to which
said notes were assigned prior to said system's receiving
said signal indicating a new note event,

(e) a new note/channel list memory location for storing
25 a list of notes and corresponding channels to which said
notes are assigned after said system's receiving said signal
indicating a new note event,

(f) a channel comparison counter for counting channel
comparisons done after said system's receiving said signal
30 indicating a new note event, and

(g) a channel commands buffer,

wherein said CPU does the following:

(1) said CPU adds said particular note to the
notes-on list if the new note event is a note-on event
35 and removes said particular note from said note-on list
if said new note event is not a note-on event;

(2) said CPU selects, depending on (i) how many notes are on the notes-on list and (ii) the predetermined number of channels, an assignment table from said assignments table memory location;

(3) said CPU assigns the notes listed on said notes-on list to said channels in accordance with the selected assignment table and creates a new note/channel list of the notes listed on the note-on list and the corresponding channels to which they have been assigned;

(4) said CPU stores said new note/channel list in said new note/channel list memory location;

(5) with said channel comparison counter set to one, said CPU begins comparing the new note/channel list to the old note channel list on a channel by channel basis;

(6) if the comparison shows that the note assigned to a channel corresponding to the value of the channel comparison counter on the new note/channel list is the same as the note assigned to that same channel on the old note/channel list, said CPU determines whether the value of the channel comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU causes the commands in the channel commands buffer to be sent to said musical synthesizer; (ii) it is not, said CPU increments the note channel counter by one and compares note/channel assignment on the new note/channel list with that on the old note/channel list for the

channel corresponding to the incremented value of the
channel comparison counter;

(7) if the comparison shows that the note assigned
to a channel corresponding to the value of the channel
comparison counter on the new note/channel list is not
the same as the note assigned to that same channel on
the old note/channel list, and if no note is assigned to
said channel on the new note/channel list, said CPU
sends a note-off command with respect to said channel
and the note currently played on that channel to said
channel commands buffer and determines whether the value
of the channel comparison counter is equal to the
predetermined number of channels, and if (i) it is, said
CPU causes the commands in the channel commands buffer
to be sent to said musical synthesizer; (ii) it is not,
said CPU increments the note channel counter by one and
compares note/channel assignment on the new note/channel
list with that on the old note/channel list for the
channel corresponding to the incremented value of the
channel comparison counter;

(8) if the comparison shows that the note assigned
to a channel corresponding to the value of the channel
comparison counter on the new note/channel list is not
the same as the note assigned to that same channel on
the old note/channel list, and if the note assigned to
said channel on the new note/channel list is not the
same as any note on the old note/channel, said CPU sends

a note-on command with respect to said channel and said note assigned to it on the new note/channel list, along with a hard attack instruction, to said channel commands buffer and determines whether the value of the channel comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU causes the commands in the channel commands buffer to be sent to said musical synthesizer; (ii) it is not, said CPU increments the note channel counter by one and compares note/channel assignment on the new note/channel list with that on the old note/channel list for the channel corresponding to the incremented value of the channel comparison counter; and

(9) if the comparison shows that the note assigned to a channel corresponding to the value of the channel comparison counter on the new note/channel list is not the same as the note assigned to that same channel on the old note/channel list, and if the note assigned to said channel on the new note/channel list is the same as any note on the old note/channel, said CPU sends a note-on command with respect to said channel and said note assigned to it on the new note/channel list, along with a soft attack instruction, to said channel commands buffer and determines whether the value of the channel comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU causes the commands in the channel commands buffer to be sent to

said musical synthesizer; (ii) it is not, said CPU increments the note channel counter by one and compares note/channel assignment on the new note/channel list with that on the old note/channel list for the channel corresponding to the incremented value of the channel comparison counter; and

(10) said CPU stores said new note/channel list in said old note/channel memory location when said commands in the channel commands buffer are caused to be sent to said musical synthesizer.

15. The system of Claim 14 wherein said musical synthesizer is a sampler.

16. The system of Claim 15 wherein said sampler includes a separate library for each of said channels.

17. A system for assigning notes to be played by a musical synthesizer to a predetermined number of channels of said musical synthesizer after said system's receiving a signal indicating a new note event, wherein a new note event is one of the following two events relating to a particular note: (i) the addition of said particular note (referred to herein as a "note-on event") to the notes being played by the musical synthesizer and (ii) the deletion of said particular note from the notes being played by said musical synthesizer, wherein each channel of said musical synthesizer is configured such that once said channel is commanded to play a particular note said channel continues playing said note until said channel is commanded to not play said note, said system including,

(a) a CPU,

15 (b) a notes-on list memory location for storing a list of notes to be played (said list of notes to be played hereinafter referred to as a "notes-on list"),

(c) an assignment tables memory location for storing assignment tables,

20 (d) an old note/channel list memory location for storing a list of notes and corresponding channels to which said notes were assigned prior to said system's receiving said signal indicating a new note event,

(e) a new note/channel list memory location for storing

25 a list of notes and corresponding channels to which said notes are assigned after said system's receiving said signal indicating a new note event,

(f) a channel comparison counter for counting channel comparisons done after said system's receiving said signal

30 indicating a new note event, and

(g) a channel commands buffer,

wherein said CPU does the following:

(1) said CPU adds said particular note to the notes-on list if the new note event is a note-on event

35 and removes said particular note from said note-on list if said new note event is not a note-on event;

(2) said CPU selects, depending on (i) how many notes are on the notes-on list and (ii) the predetermined number of channels, an assignment table

40 from said assignments table memory location;

(3) said CPU assigns the notes listed on said notes-on list to said channels in accordance with the selected assignment table and creates a new note/channel list of the notes listed on the note-on list and the corresponding channels to which they have been assigned;

(4) said CPU stores said new note/channel list in said new note/channel list memory location;

(5) with said channel comparison counter set to one, said CPU begins comparing the new note/channel list to the old note channel list on a channel by channel basis;

(6) if the comparison shows that the note assigned to a channel corresponding to the value of the channel comparison counter on the new note/channel list is the same as the note assigned to that same channel on the old note/channel list, said CPU determines whether the value of the channel comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU ceases channel comparisons; (ii) it is not, said CPU increments the note channel counter by one and compares note/channel assignment on the new note/channel list with that on the old note/channel list for the channel corresponding to the incremented value of the channel comparison counter;

(7) if the comparison shows that the note assigned to a channel corresponding to the value of the channel comparison counter on the new note/channel list is not

the same as the note assigned to that same channel on the old note/channel list, and if no note is assigned to said channel on the new note/channel list, said CPU sends a note-off command with respect to said channel and the note currently played on that channel to said channel commands buffer and determines whether the value of the channel comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU ceases channel comparisons; (ii) it is not, said CPU increments the note channel counter by one and compares note/channel assignment on the new note/channel list with that on the old note/channel list for the channel corresponding to the incremented value of the channel comparison counter;

(8) if the comparison shows that the note assigned to a channel corresponding to the value of the channel comparison counter on the new note/channel list is not the same as the note assigned to that same channel on the old note/channel list, and if the note assigned to said channel on the new note/channel list is not the same as any note on the old note/channel, said CPU sends a note-on command with respect to said channel and said note assigned to it on the new note/channel list, along with a hard attack instruction, to said channel commands buffer and determines whether the value of the channel comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU ceases channel

95 comparisons; (ii) it is not, said CPU increments the
note channel counter by one and compares note/channel
assignment on the new note/channel list with that on the
old note/channel list for the channel corresponding to
the incremented value of the channel comparison counter;
100 and

(9) if the comparison shows that the note assigned
to a channel corresponding to the value of the channel
comparison counter on the new note/channel list is not
the same as the note assigned to that same channel on
105 the old note/channel list, and if the note assigned to
said channel on the new note/channel list is the same as
any note on the old note/channel, said CPU sends a note-
on command with respect to said channel and said note
assigned to it on the new note/channel list, along with
110 a soft attack instruction, to said channel commands
buffer and determines whether the value of the channel
comparison counter is equal to the predetermined number
of channels, and if (i) it is, said CPU ceases channel
comparisons; (ii) it is not, said CPU increments the
115 note channel counter by one and compares note/channel
assignment on the new note/channel list with that on the
old note/channel list for the channel corresponding to
the incremented value of the channel comparison counter;
and

120 (10) said CPU stores said new note/channel list in
said old note/channel memory location when the value of

the channel comparison counter is equal to the predetermined number of channels.

18. A system for assigning notes to be played by a musical synthesizer to a predetermined number of channels of said musical synthesizer after said system's receiving a signal indicating a new note event, wherein a new note event is one of the following two events relating to a particular note: (i) the addition of said particular note (referred to herein as a "note-on event") to the notes being played by the musical synthesizer and (ii) the deletion of said particular note from the notes being played by said musical synthesizer, wherein each channel of said musical synthesizer is configured such that once said channel is commanded to play a particular note said channel continues playing said note until said channel is commanded to not play said note, said system including,

(a) a CPU,

(b) a notes-on list memory location for storing a list of notes to be played (said list of notes to be played hereinafter referred to as a "notes-on list"),

(c) an assignment tables memory location for storing assignment tables,

(d) an old note/channel list memory location for storing a list of notes and corresponding channels to which said notes were assigned prior to said system's receiving said signal indicating a new note event,

(e) a new note/channel list memory location for storing a list of notes and corresponding channels to which said

notes are assigned after said system's receiving said signal indicating a new note event,

(f) a channel comparison counter for counting channel comparisons done after said system's receiving said signal indicating a new note event, and

(g) a channel commands buffer,
wherein said CPU does the following:

(1) said CPU adds said particular note to the notes-on list if the new note event is a note-on event and removes said particular note from said note-on list if said new note event is not a note-on event;

(2) said CPU selects, depending on (i) how many notes are on the notes-on list and (ii) the predetermined number of channels, an assignment table from said assignments table memory location;

(3) said CPU assigns the notes listed on said notes-on list to said channels in accordance with the selected assignment table and creates a new note/channel list of the notes listed on the note-on list and the corresponding channels to which they have been assigned;

(4) said CPU stores said new note/channel list in said new note/channel list memory location;

(5) with said channel comparison counter set to one, said CPU begins comparing the new note/channel list to the old note channel list on a channel by channel basis;

(6) if the comparison shows that the note assigned to a channel corresponding to the value of the channel comparison counter on the new note/channel list is the same as the note assigned to that same channel on the old note/channel list, said CPU determines whether the value of the channel comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU causes the commands in the channel commands buffer to be sent to said musical synthesizer; (ii) it is not, said CPU increments the note channel counter by one and compares note/channel assignment on the new note/channel list with that on the old note/channel list for the channel corresponding to the incremented value of the channel comparison counter;

(7) if the comparison shows that the note assigned to a channel corresponding to the value of the channel comparison counter on the new note/channel list is not the same as the note assigned to that same channel on the old note/channel list, and if no note is assigned to said channel on the new note/channel list, said CPU sends a note-off command with respect to said channel and the note currently played on that channel to said channel commands buffer and determines whether the value of the channel comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU causes the commands in the channel commands buffer to be sent to said musical synthesizer; (ii) it is not,

said CPU increments the note channel counter by one and
80 compares note/channel assignment on the new note/channel
list with that on the old note/channel list for the
channel corresponding to the incremented value of the
channel comparison counter;

(8) if the comparison shows that the note assigned
85 to a channel corresponding to the value of the channel
comparison counter on the new note/channel list is not
the same as the note assigned to that same channel on
the old note/channel list, and if the new note event is
a note-on event, said CPU sends a note-on command with
90 respect to said channel and said note assigned to it on
the new note/channel list, along with a hard attack
instruction, to said channel commands buffer and
determines whether the value of the channel comparison
counter is equal to the predetermined number of
95 channels, and if (i) it is, said CPU causes the commands
in the channel commands buffer to be sent to said
musical synthesizer; (ii) it is not, said CPU increments
the note channel counter by one and compares
note/channel assignment on the new note/channel list
100 with that on the old note/channel list for the channel
corresponding to the incremented value of the channel
comparison counter; and

(9) if the comparison shows that the note assigned
to a channel corresponding to the value of the channel
105 comparison counter on the new note/channel list is not

the same as the note assigned to that same channel on the old note/channel list, and if the new note event is not a note-on event, said CPU sends a note-on command with respect to said channel and said note assigned to it on the new note/channel list, along with a soft attack instruction, to said channel commands buffer and determines whether the value of the channel comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU causes the commands in the channel commands buffer to be sent to said musical synthesizer; (ii) it is not, said CPU increments the note channel counter by one and compares note/channel assignment on the new note/channel list with that on the old note/channel list for the channel corresponding to the incremented value of the channel comparison counter; and

(10) said CPU stores said new note/channel list in said old note/channel memory location when said commands in the channel commands buffer are caused to be sent to said musical synthesizer.

19. The system of Claim 18 wherein said musical synthesizer is a sampler.

20. The system of Claim 19 wherein said sampler includes a separate library for each of said channels.

21. A system for assigning notes to be played by a musical synthesizer to a predetermined number of channels of said musical synthesizer after said system's receiving a signal indicating a

new note event, wherein a new note event is one of the following
5 two events relating to a particular note: (i) the addition of said
particular note (referred to herein as a "note-on event") to the
notes being played by the musical synthesizer and (ii) the
deletion of said particular note from the notes being played by
said musical synthesizer, wherein each channel of said musical
10 synthesizer is configured such that once said channel is commanded
to play a particular note said channel continues playing said note
until said channel is commanded to not play said note, said system
including,

(a) a CPU,

15 (b) a notes-on list memory location for storing a list
of notes to be played (said list of notes to be played
hereinafter referred to as a "notes-on list"),

(c) an assignment tables memory location for storing
assignment tables,

20 (d) an old note/channel list memory location for
storing a list of notes and corresponding channels to which
said notes were assigned prior to said system's receiving
said signal indicating a new note event,

(e) a new note/channel list memory location for storing
25 a list of notes and corresponding channels to which said
notes are assigned after said system's receiving said signal
indicating a new note event,

(f) a channel comparison counter for counting channel
comparisons done after said system's receiving said signal
30 indicating a new note event, and

(g) a channel commands buffer,
wherein said CPU does the following:

35 (1) said CPU adds said particular note to the
notes-on list if the new note event is a note-on event
and removes said particular note from said note-on list
if said new note event is not a note-on event;

 (2) said CPU selects, depending on (i) how many
notes are on the notes-on list and (ii) the
predetermined number of channels, an assignment table
40 from said assignments table memory location;

 (3) said CPU assigns the notes listed on said
notes-on list to said channels in accordance with the
selected assignment table and creates a new note/channel
list of the notes listed on the note-on list and the
45 corresponding channels to which they have been assigned;

 (4) said CPU stores said new note/channel list in
said new note/channel list memory location;

 (5) with said channel comparison counter set to
one, said CPU begins comparing the new note/channel list
50 to the old note channel list on a channel by channel
basis;

 (6) if the comparison shows that the note assigned
to a channel corresponding to the value of the channel
comparison counter on the new note/channel list is the
55 same as the note assigned to that same channel on the
old note/channel list, said CPU determines whether the
value of the channel comparison counter is equal to the

predetermined number of channels, and if (i) it is, said CPU ceases channel comparisons; (ii) it is not, said CPU increments the note channel counter by one and compares note/channel assignment on the new note/channel list with that on the old note/channel list for the channel corresponding to the incremented value of the channel comparison counter;

(7) if the comparison shows that the note assigned to a channel corresponding to the value of the channel comparison counter on the new note/channel list is not the same as the note assigned to that same channel on the old note/channel list, and if no note is assigned to said channel on the new note/channel list, said CPU sends a note-off command with respect to said channel and the note currently played on that channel to said channel commands buffer and determines whether the value of the channel comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU ceases channel comparisons; (ii) it is not, said CPU increments the note channel counter by one and compares note/channel assignment on the new note/channel list with that on the old note/channel list for the channel corresponding to the incremented value of the channel comparison counter;

(8) if the comparison shows that the note assigned to a channel corresponding to the value of the channel comparison counter on the new note/channel list is not

85 the same as the note assigned to that same channel on
the old note/channel list, and if the note assigned to
said channel on the new note/channel list is not the
same as any note on the old note/channel, said CPU sends
a note-on command with respect to said channel and said
90 note assigned to it on the new note/channel list, along
with a hard attack instruction, to said channel commands
buffer and determines whether the value of the channel
comparison counter is equal to the predetermined number
of channels, and if (i) it is, said CPU ceases channel
95 comparisons; (ii) it is not, said CPU increments the
note channel counter by one and compares note/channel
assignment on the new note/channel list with that on the
old note/channel list for the channel corresponding to
the incremented value of the channel comparison counter;
100 and

(9) if the comparison shows that the note assigned
to a channel corresponding to the value of the channel
comparison counter on the new note/channel list is not
the same as the note assigned to that same channel on
105 the old note/channel list, and if the note assigned to
said channel on the new note/channel list is the same as
any note on the old note/channel, said CPU sends a note-
on command with respect to said channel and said note
assigned to it on the new note/channel list, along with
110 a soft attack instruction, to said channel commands
buffer and determines whether the value of the channel

comparison counter is equal to the predetermined number of channels, and if (i) it is, said CPU ceases channel comparisons; (ii) it is not, said CPU increments the
115 note channel counter by one and compares note/channel assignment on the new note/channel list with that on the old note/channel list for the channel corresponding to the incremented value of the channel comparison counter; and
120 (10) said CPU stores said new note/channel list in said old note/channel memory location when the value of the channel comparison counter is equal to the predetermined number of channels.